is directed to a method of processing signals and recites a step of "selecting a diversity pattern having plural elements corresponding to plural signal sources and plural times." The instant application includes a description of Orthogonal Transmit Diversity (OTD) and Time Switched Time Diversity (TSTD) patterns of the prior art. (page 2, line 18 through page 4, line 11). Claim 29 further requires "selecting a symbol pattern having a plurality of symbols corresponding to plural signal sources and plural times." The instant specification further describes selection of a Space Time Transmit Diversity (STTD) symbol pattern (FIG. 2 and TABLE 1, page 7) in lieu of a symbol pattern of the prior art. (page 13, lines 1-4). Finally, claim 29 requires "producing an overlay of each element of the diversity pattern with the symbol pattern." Production of exemplary overlay patterns of STTD symbols with OTD and TSTD patterns are shown at equations [15] and [16], respectively. (page 13). Applicants, therefore, find support for every element of claim 29 in the instant specification as originally filed. Thus, applicants respectfully submit that claim 29 is patentable under 35 U.S.C. § 112, first paragraph.

Claim 36 is rejected under 35 U.S.C. § 112, first paragraph, for lacking a description of "not transmitting from the third and the fourth antennas during a part of the first time" and "not transmitting from the first and the second antennas during a part of the third time." Referring to page 13, there is a four-antenna STTD overlay of a TSTD pattern for four times corresponding to respective columns of equation [16]. Elements ϕ are null elements when alternate antennas are transmitting. (page 13, lines 11-13). From equation [16], antennas 1 and 2 transmit respective symbols a and $-b^*$ at a first time while "not transmitting from the third and the fourth antennas during a part of the first time." Furthermore, antennas 3 and 4 transmit respective symbols c and $-d^*$ at a third time while "not transmitting from the first and the second antennas during a part of the third time." Thus, applicants respectfully submit that claim 36 is patentable under 35 U.S.C. § 112, first paragraph.

Examiner has rejected claims 30-36 under 35 U.S.C. § 112, first paragraph, because they depend on claim 29. Applicants further submit, therefore, that claims 30-36 are patentable under 35 U.S.C. § 112, first paragraph, because claim 29 is patentable.

Examiner has rejected claim 37 under 35 U.S.C. § 112, first paragraph, for lacking a description in the specification of the step of "decoding the overlay pattern according to a symbol pattern." Exemplary overlay patterns of page 13, equations [15] and [16], are decoded in the same manner as described at page 8, line 14 through page 9, line 10. (FIG. 3). The instant specification describes the four upper-left matrix elements $\begin{bmatrix} a & b & -b^* & a^* \end{bmatrix}$ of equation [15] that correspond to transmitted STTD symbols $\begin{bmatrix} S_1 & S_2 & -S_2^* & S_1^* \end{bmatrix}$ of FIG. 2. (page 13, lines 6-8). These transmitted STTD symbols of FIG. 2 are decoded by the circuit of FIG. 3. The overlay of equation [16] operates in the same manner as FIG. 3, since two symbols are received during a first time from Ant_1 and Ant_2, respectively. The overlay of equation [15] operates in the same manner as the overlay of equation [16] except that four symbols are received during a first time. Thus, applicants respectfully submit that claim 37 is patentable under 35 U.S.C. § 112, first paragraph.

Claim 44 is rejected under 35 U.S.C. § 112, first paragraph, for lacking a description of "not decoding a symbol from the third and the fourth antennas during the first time; and not decoding from the first and the second antennas during the third time." Referring to page 13, there is a four-antenna STTD overlay of a TSTD pattern for four times corresponding to respective columns of equation [16]. Elements ϕ are null elements when alternate antennas are transmitting. (page 13, lines 11-13). From equation [16], the decode circuit (FIG. 3) decodes respective symbols *a* and *-b** from antennas 1 and 2 at a first time while "not decoding a symbol from the third and the fourth antennas during the first time." The decode circuit decodes respective symbols *c* and *-d** from antennas 3 and 4 at a third time while "not decoding from the first and second antennas during the third time." Thus, applicants respectfully submit that claim 44 is patentable under 35 U.S.C. § 112, first paragraph.

Examiner has rejected claims 38-45 under 35 U.S.C. § 112, first paragraph, because they depend on claim 37. Applicants further submit, therefore, that claims 38-45 are patentable under 35 U.S.C. § 112, first paragraph, because claim 37 is patentable.

Rejections under 35 U.S.C. § 112, second paragraph.

Examiner has rejected claims 36 and 44 under 35 U.S.C. § 112, second paragraph. Claims 36 and 44 depend from claims 29/34 and 37/43, respectively. Referring to page 13, there is a four-antenna STTD overlay of a TSTD pattern for four times corresponding to respective columns of equation [16]. Elements ϕ are null elements when alternate antennas are transmitting. (page 13, lines 11-13). Limitations of "not transmitting" (claim 36) and "not receiving" (claim 44) refer to these exemplary null elements of equation [16] when transmission alternates between antennas. Thus, applicants respectfully submit that claims 36 and 44 are patentable under 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 103(a).

Examiner has rejected claims 1-28 under 35 U.S.C. § 103(a) as being unpatentable over Gilhousen et al. (U.S. Pat. No. 5,056,109) in view of Sousa et al. (U.S. Pat. No. 5,832,044). Applicants agree that closed-loop power control as disclosed by Gilhousen et al. is prior art. (page 3, line 14 through page 4, line 11). Examiner admits and applicants agree that Gilhousen et al. do not disclose that the first input signal and the second input signal are being transmitted at a first time and from different antennas, respectively. Applicants further agree with Examiner that Sousa et al. disclose three types of diversity. (paper no. 6, pages 4-5). Applicants, however, fail to find any teaching or suggestion by Sousa et al. that any of these three diversity methods might be combined. Applicants also fail to find any teaching or suggestion by Sousa et al. that any diversity method other than "Time Interleaving" might be combined with "Power Control." Furthermore, Sousa et al. explicitly teach that "the transmitter uses a single antenna and a single carrier frequency" for Time Interleaving and Power Control. (Channel Model 3, col. 14, lines 7-10 and col. 18, lines 29-32). Thus, applicants respectfully submit that neither Gilhousen et al. nor Sousa et al., taken alone or in combination, teach or suggest the instant invention of claims 1-28.

Claim 1 recites "a measurement circuit coupled to receive *a first input signal from a first antenna* of a transmitter and coupled to receive *a second input signal from a second antenna* of the transmitter, each of the first and second input signals being *transmitted at a first time*, the measurement circuit producing *an output signal corresponding to a magnitude of the first and second input signals*." Claim 17 recites "a measurement circuit coupled to receive a *first input signal from a first antenna of a transmitter at a first time* and coupled to receive *a second input signal from a second antenna of the transmitter at a third time*, the measurement circuit producing *a first output signal corresponding to a magnitude of the first input signal and producing a second output signal corresponding to a magnitude of the second input signal*." (emphasis added).

Claim 22 recites "receiving *a plurality of input signals being transmitted at a first time*, the plurality of input signals *corresponding to a respective plurality of antennas*; *measuring each input signal* of the plurality of input signals and producing at least one output signal." Claim 25 recites "*receiving at least one control signal* transmitted from an external source at a first time; producing *a transmit power level of each of a plurality of antennas* in response to the control signal; *transmitting a plurality of signals* to the external source *at a respective said transmit power level* at a second time *from a respective said plurality of antennas*." (emphasis added).

Applicants fail to find any teaching or suggestion of the above claim elements in the disclosures of Gilhousen et al. or Sousa et al., taken alone or in combination. Moreover, Examiner has not identified any teaching or suggestion to combine the disclosures of Gilhousen et al. and Sousa et al. to produce the invention of claims 1-28. Examiner cites col. 3, lines 18-25, for the proposition that Sousa et al. discloses three types of diversity. Applicants agree. However, Sousa et al. fail to disclose a combination of any two types of diversity or even an advantage to combining different types of diversity. For example, there is no suggestion of combined space (two antennas) and time (different symbols transmitted at a first time) diversity as with claim 1 to "receive *a first input signal from a first antenna* of a transmitter and coupled to receive *a second input signal from a second antenna* of the transmitter, each of the first and second input signals being *transmitted at a first time*." Nor is there any suggestion of how power control might be achieved with combined

space and time diversity as with claim 1 "producing an output signal corresponding to a magnitude of the first and second input signals."

Furthermore, Sousa et al. specifically teach away from the claimed invention. Sousa et al. specifically teach power control with time interleaving diversity. Applicants fail to find any suggestion by Sousa et al. to combine either power control or time interleaving with other forms of diversity. Moreover, Sousa et al. teach that "the transmitter uses a single antenna and a single carrier frequency" for time interleaving with power control. (Channel Model 3, col. 14, lines 7-10 and col. 18, lines 29-32). At the time of the invention, therefore, a person having ordinary skill in the art to which the subject matter pertains would not think to combine the teaching of Gilhousen et al. and Sousa et al. to produce the invention of claims 1-28 without impermissible hindsight from the instant specification. Thus, applicants respectfully submit that claims 1-28 are patentable under 35 U.S.C. § 103(a) over Gilhousen et al. in view of Sousa et al.

Examiner has rejected claims 29 and 37 under 35 U.S.C. § 103(a) as being unpatentable over Gilhousen et al. in view of Sousa et al. and further in view of Bolgiano et al. (U.S. Pat. No. 5,859,879). Claim 29 is directed to a method of processing signals and recites steps of "selecting *a diversity pattern having plural elements corresponding to plural signal sources and plural times*; selecting *a symbol pattern having a plurality of symbols corresponding to plural signal sources and plural times*; *producing an overlay* of each element of the diversity pattern with the symbol pattern." Examiner interprets "a data packet which carries digital telephone traffic is transmitted at three different times from three different antennas" of Bolgiano et al. as "a symbol pattern having a plurality of symbols corresponding to plural signal sources and plural times" as required by claim 29. According to Examiner's interpretation, therefore, "a data packet" of Bolgiano et al. corresponds to "a symbol pattern" of claim 29. Then the step of "selecting a diversity pattern" as required by claim 29, cannot correspond to selecting "a data packet" or "the best data packet" as suggested by Examiner. (paper no. 6, page 9). Otherwise, "a diversity pattern" and "a symbol pattern" would necessarily be the same thing. Moreover, such an interpretation would preclude the step of "producing an overlay of each element of the diversity pattern with the symbol pattern."

This would suggest producing an overlay of a data packet with itself. Applicants fail to find any teaching or suggestion by Bolgiano et al. to produce such an overlay or that there might be an advantage of such an overlay.

Examiner further suggests that "producing of overlay pattern has been disclosed in "Prior art" labeled Fig. 5." (paper no. 6, page 9). Applicants disagree. The transmit circuit of FIG. 5 illustrates an orthogonal transmit diversity (OTD) pattern of the prior art. (page 2, lines 18-28). This exemplary OTD pattern is taken as "*a diversity pattern having plural elements corresponding to plural signal sources and plural times*" in equation [15]. An STTD symbol pattern as in FIG. 2 is taken as "*a symbol pattern having a plurality of symbols corresponding to plural signal sources and plural times.*" The step of "*producing an overlay* of each element of the diversity pattern with the symbol pattern" is accomplished by substituting the STTD symbol pattern of FIG. 2 for each element of the diversity pattern of FIG. 5, thereby producing equation [15]. This step is explained in detail at page 13, lines 6-13, of the instant specification. Applicants fail to find any teaching or suggestion that would motivate a person having ordinary skill in the art to which the subject matter pertains at the time of the invention to combine the teaching of Gilhousen et al., Sousa et al. or Bolgiano et al. to produce these features of claim 29. Thus, applicants respectfully submit that claims 29-36 are patentable under 35 U.S.C. § 103(a).

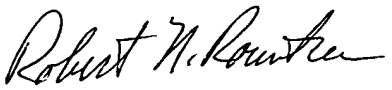
Examiner has further rejected claim 37 under 35 U.S.C. § 103(a), stating that "this claim is substantially directed to the same subject matter in claim 29." (paper no. 6, page 9). Applicants substantially agree except that claim 37 is directed to "receiving an overlay pattern," "decoding the overlay pattern according to a diversity pattern" and "decoding the overlay pattern according to a symbol pattern." Since none of the cited references teach or suggest the previously discussed elements of claim 29 or the corresponding elements of claim 37, applicants respectfully submit that claims 37-45 are also patentable under 35 U.S.C. § 103(a).

Examiner has rejected claims 30-31, depending from claim 29, and claims 38-39, depending from claim 37, under 35 U.S.C. § 103(a) over previously cited references in view of

Bottomley (U.S. Pat. No. 5,506,861). Applicants respectfully submit that claims 30-31 and 38-39 are patentable under 35 U.S.C. § 103(a) for all the foregoing reasons.

In view of the foregoing, applicants respectfully request reconsideration and allowance of claims 1-45. If Examiner finds any issue that is unresolved, he may reach applicants' attorney by dialing the telephone number printed below.

Respectfully submitted,



Robert N. Rountree
Reg. No. 39,347
Attorney for Applicants

Texas Instruments Incorporated
P. O. Box 655474, M/S 3999
Dallas, Texas 75265
(972) 917-4431
Fax: (972) 917-4418